FIG 1

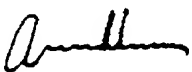| Path # used in the prototype study notebook	Silhouette	Definition of Profile
.001	*a*	Capital "A" with no "poles" or "holes" (No protruding letters like " b, d, h, k, l" above midline or below baseline such as "g, p, y, z, x, etc.)
.002	*a*	Capital "A" with one "hole" (down stroke) somewhere in the middle of the word --at least one letter away from the capital "A" and not at the end.
.003	*a*	Capital "A" with one "hole" (down stroke) at the end.
.005	*a*	Capital "A" with one "pole" (high stroke) somewhere in the middle of the word --at least one letter away from the capital "A" and not at the end or next to the end.
.006	*a*	Capital "A" with one "pole" (high stroke) located one letter away from the end -- such as "-le, -ly, -de, -te, -dy, -by, etc."
.007	*a*	Capital "A" with one "pole" (high stroke) located at the end.

Fig 2A
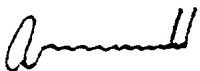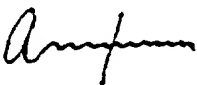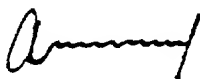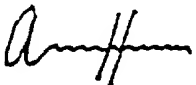
Path # used in the prototype study notebook	Silhouette	Definition of Profile
.025		Capital "A" with two adjacent "poles" (two consecutive up strokes) somewhere in the middle of the word -- at least one letter away from the capital "A" and not at the end
.043		Capital "A" with two adjacent "poles" (two consecutive up strokes) at the terminal end.
.052		Capital "A" with "pole" fused with a "hole" creating a continuous line that breaks both the upper and lower horizon lines. --- This would recognize the present day cursive letter "f" and could also filter 18th century words for the old style "s".
.092		Terminal 'f' or 18th century "s"
.102		Double "f" or double 18th century "s" located in the middle of the name.
.120		Double terminal "f" or 18th century "s" at end of the word.

Fig 2B

$$\mathcal{A}\!\!\!\sim\!\!\!\!\!\!\!\!\sim + \mathcal{A}\!\!\!\sim\!\!\!\!\!\!\sim \longrightarrow \mathcal{A}\!\!\!\sim\!\!\!\!\!\!\!\sim$$

.002   .005   2-5

Fig 3A

The same two prime profiles could be fused in the opposite order to yield a "5 - 2" hybrid.

$$\mathcal{A}\!\!\!\sim\!\!\!\!\!\!\sim + \mathcal{A}\!\!\!\sim\!\!\!\!\!\!\!\!\sim \longrightarrow \mathcal{A}\!\!\!\sim\!\!\!\!\!\!\!\sim$$

.005   .002   5-2

FIG 3B

Naming First Syllable Blends:

"high profile" letters or "Talls"	Prime #	"low profile" letters (gophers)	Prime #	both High and Low profile letter	Prime #	First Syllable Blend	FILE #	Definition
						A----	10	"A" \ no high profile in adjacent position
b	1					Ab---	110.	"Ab"-- only one high profile letter followed by median
						Abb---	111.	"Abb"-- two high profile letters adjacent to "A"
d	2					Ad---	120.	2nd letter "high" 3rd letter "median"
						Adb--	121.	2 "Highs" (d b)
						Add--	122.	2 "Highs" (d d)
						Adk--	124.	2 "Highs" (d k)
						Adl---	125.	2 "Highs" (d l)

FIG 4

| Town	Photocopy of Document (N.Y. Tax Rolls – 1800)	Path # (Zip Code)	Hybridization Factors	Silhouette	Digitized Name
Brookfield					
1	Amiss Zebulon	10.001	–	_a_	Amos
2	Anderson William	10.016	5·2	_a_	Anderson
3	Anderson William Jun.	10.061	5·52	_a_	Anderson
4	Allen Hezekiah	155.001		_a_	Allen
5	Abbey Daniel	111.003	–	_a_	Abbey
Cazenovia					
6	Alger Oliver	153.007	–	_a_	Alger
7	Alger Saul	same		same	same
8	Adams Daniel	120.001	–	_a_	Adams
9	Allen William	155.001	–	_a_	Allen
10	Anderson William	10.005	–	_a_	Anderson
11	Abby Richard	111.003	–	_a_	Abby
12	Aldridge Dudley	152.016	5·2	_a_	Aldridge
13	Aditt Henry	120.043	–	_a_	Aditt
14	Alsworth Jasper	150.043	–	_a_	Alsworth
15	Anderson Harmonius	10.005	–	_a_	Anderson
16	Aldridge Joseph	152.016	5·2	_a_	Aldridge
17	Arnold Riley	10.043	–	_a_	Arnold
18	Alvord Benjamin	150.007	–	_a_	Alvord
19	Alvord Ira	Same		same	same
20	Abell Isben	110.043	–	_a_	Abell
21	Annis Oliver	10.001	–	_a_	Annis (Amiss)
22	Abbat Willard	111.007	–	_a_	Abbot (Abbat)
23	Austin Caleb	10.005	–	_a_	Austin
24	Aber William	110.001	–	_a_	Aber
25	Ashard Samuel	10.023	5·7	_a_	Ashard *
26	Allverton William	155.005	–	_a_	Allverton

F165

* Name found in 1800 N.Y. tax rolls, but not in West L.A. phone book Consequently, this would not have been included in a spellcheck lis

#'s	PRIME	PRIME	2-3	PRIME	PRIME	PRIME	2-2	2-5	2-5-3
silhouette	*a*	*arr*	*army*	*army*	*andr*	*arnd*	*arnd*	*argg*	*ark*	*ankly*
					Acken					
Aaron				Acker	Acevedo	Acret			
Aaronson				Ackerman					
				Ackermann					
Accas				Ackerson					
Acamon				Acton	Acosta				
Acres				Ainslie					
Aceves				Amber		Amet			
				Ambers		Amick			
Ain		Airev		Ambrose		Amound			
Ainis				Ambrosini					
Airs				Ambrosio					
				Amiani					
Ames	Amoaro	Amev		Amier					
Amies	Amoere	Amery		Amin					
Amiri				Anastasi		Anisn		Angelina	
Amirian	Amvas			Anderson		Annand		Arceus	
Amis				Andersson		Ansel		Anglin	
Amiss				Andiman				Angsten	
Ammerman				Andrew					
Ammons				Andrews					
Amos				Andrus					
Amron				Anker					
				Ankers					
Anis	Angres			Annakin					
Anisman		Anning		Anselmo					
Annis	Anguiano			Anslie					
Ansin		Ansary		Anstie					
Anson		Ansav		Antin				Anzalone	
Ansan				Anton					
Anwar	Angus								
	Angwin			Arbisser		Arch		Arguenta → 2-6	
Arenson	Anyan			Archie	Anola	Arnench		Arrington	
Arias		Arcay		Archer	Armenta	Armand			
Aris		Amey		Arden	Arruda	Armond			
Anson		Aronowicz		Ardern					
Armer	Aragon			Ardmore					
Armon	Araiza			Arduser					
Armour	Anza			Arlen					
Arnesen				Ascher		Ash			
Aron				Asher					
Aronson				Ashenan					
Aronow				Ashman					
Arrow				Ashmore					
				Ashoun					
Asimov				Askan					
Asner				Askin					
				Askew					
Auer				Aster					
Aves				Aston		Auch		Augustein	
Avin		Avery		Austen	Avila			Augustine	
1/6/99 Avins				Austin		Aveni			

Fig.6

System Description
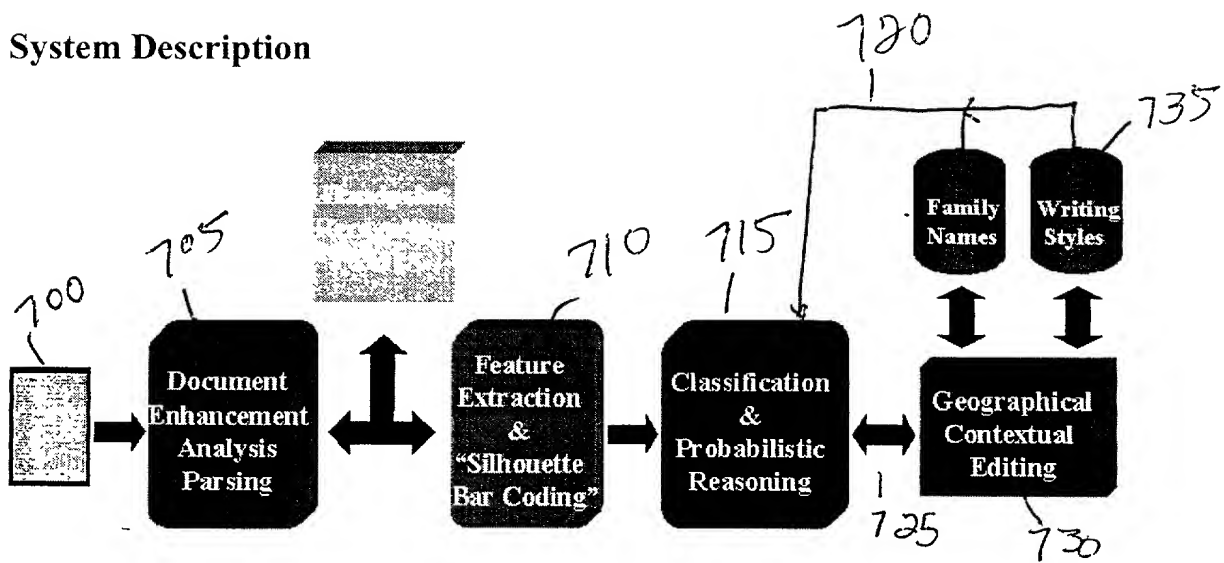
System Block Diagram

FIG 7

§ **Preprocessing:**

800 Define cursive field columns
& printing (integers)
& column delimiter

805 Set word both
& word zones
waistline, centerline baseline
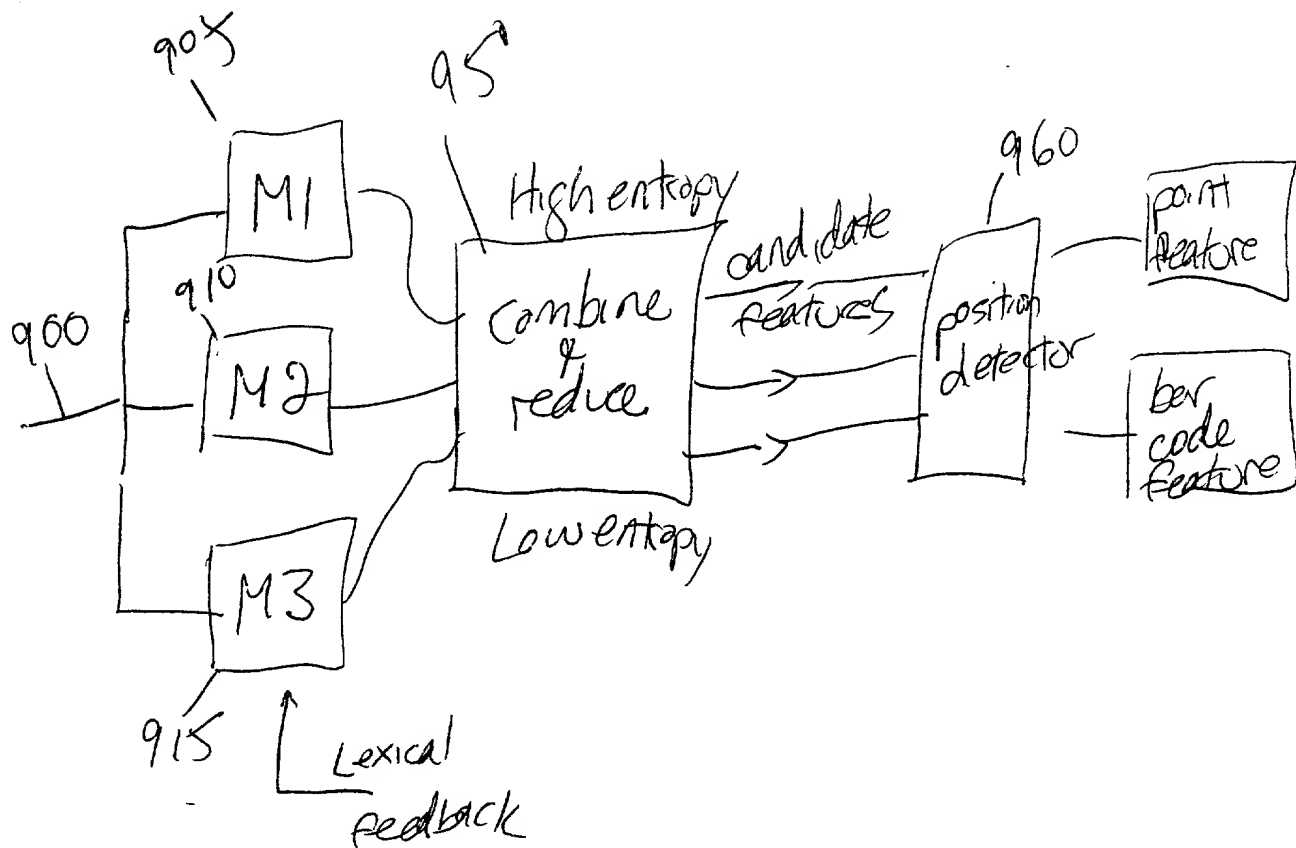
810 Noise removal
Stray marks/distance

815 Thinning skeletonization

820 Height normalization
Preserve aspect ratio

(A)

FIG 8

905

95

960

M1

910

900

M2

M3

915

High entropy

Combine & reduce

Low entropy

candidate features

position detector

point feature

bar code feature

Lexical feedback

FIG 9

1000

1010

-Word- ~1005

FIG 10

A

Silhouette bar codes — 1170

PROFICES N-S — 1100

CAVITIES N, S, E, W C, H — 1130

SLOPE SEQUENCING — 1150

D-HMM — 1175 — 1105

Extract relative profile

Coarse coding feature vector — 1135

SLOPE FEATURE EXTRACT — 1155

Feature vector — 1176

DCT encode

Bayesian SVM — 1110

Bayesian Classifier — 1140

SLOPE SYMBOLIC SEQUENCE — 1160

CLASSIFIER DISCRETE HMM C GARN — 1165

CONTEXTUAL EDITING — 1190
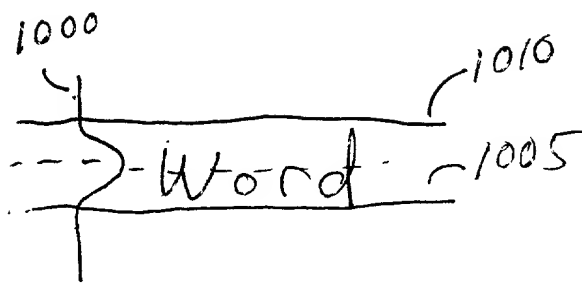
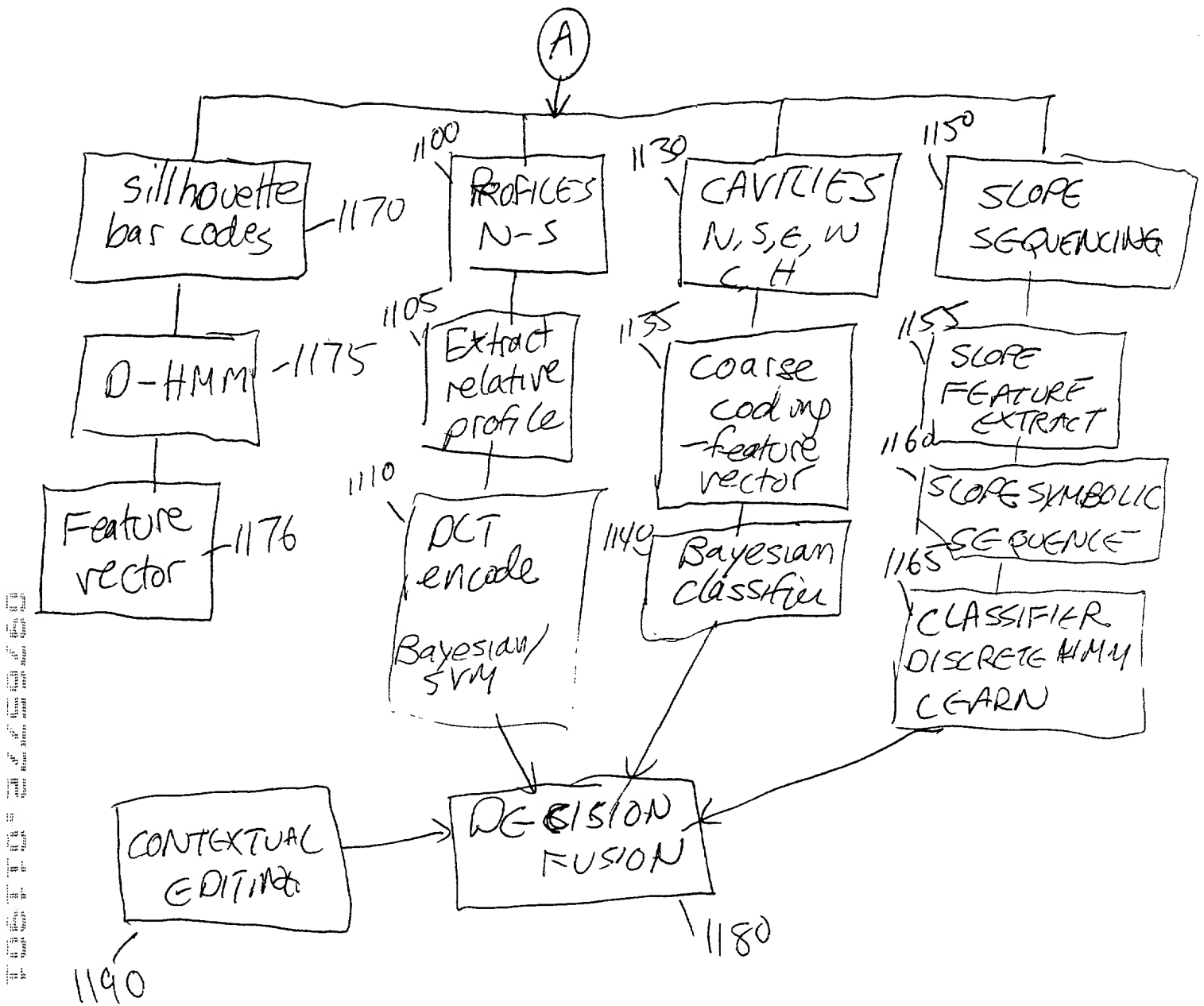DECISION FUSION — 1180

FIG 11

Figure 12. The north (blue) and south (red) profiles extracted from the cursive name Catharine.
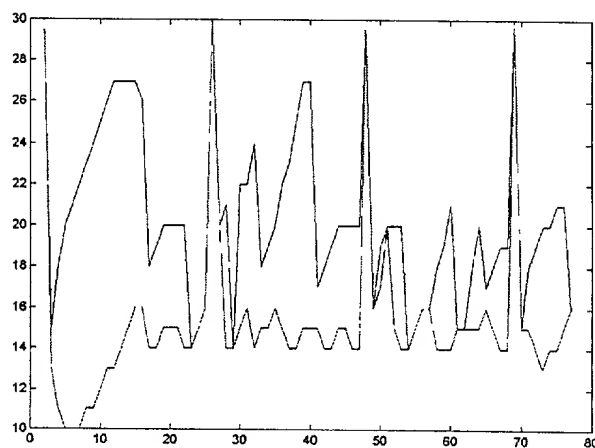
Catharine

FIG. 12

North

West   Word   East

Holes   South   Center

Figure 13. Cavity feature extraction results.

FIG. 13